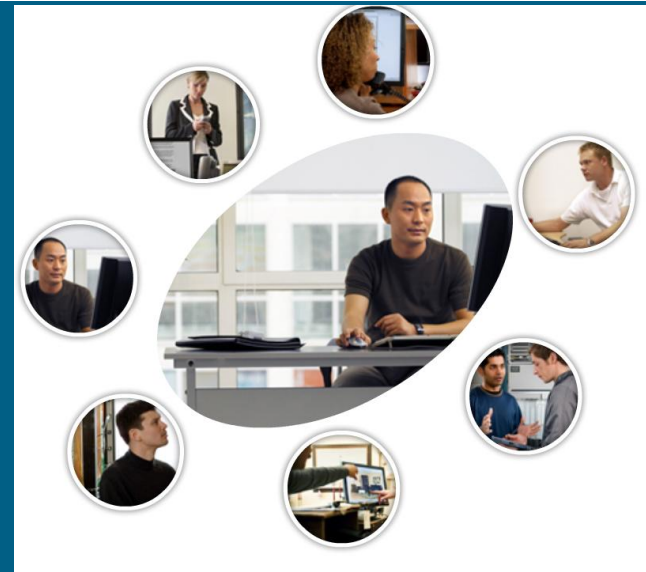




LAN Design



LAN Switching and Wireless – Chapter 1

Objectives

- Describe how a hierarchical network supports the voice, video and data needs of a small and medium-sized business.
- Match the appropriate Cisco switch to each layer in the hierarchical network design model.

Describe how a Hierarchical Network Supports the Needs of a Small & Medium-Sized Business

- Explain the benefits of the hierarchical network model

Benefits of a Hierarchical Network

Scalability

- Hierarchical networks can be expanded easily

Redundancy

- Redundancy at the core and distribution level ensure path availability

Performance

- Link aggregation between levels and high-performance core and distribution level switches allow for near wire-speed throughout the network

Security

- Port security at the access level and policies at the distribution level make the network more secure

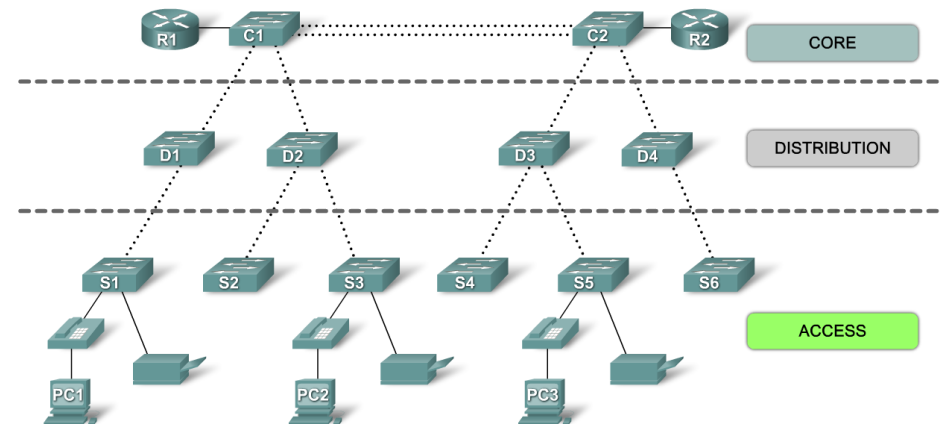
Manageability

- Consistency between switches at each level makes management more simple

Maintainability

- The modularity of hierarchical design allows for the network to scale without becoming overly complicated

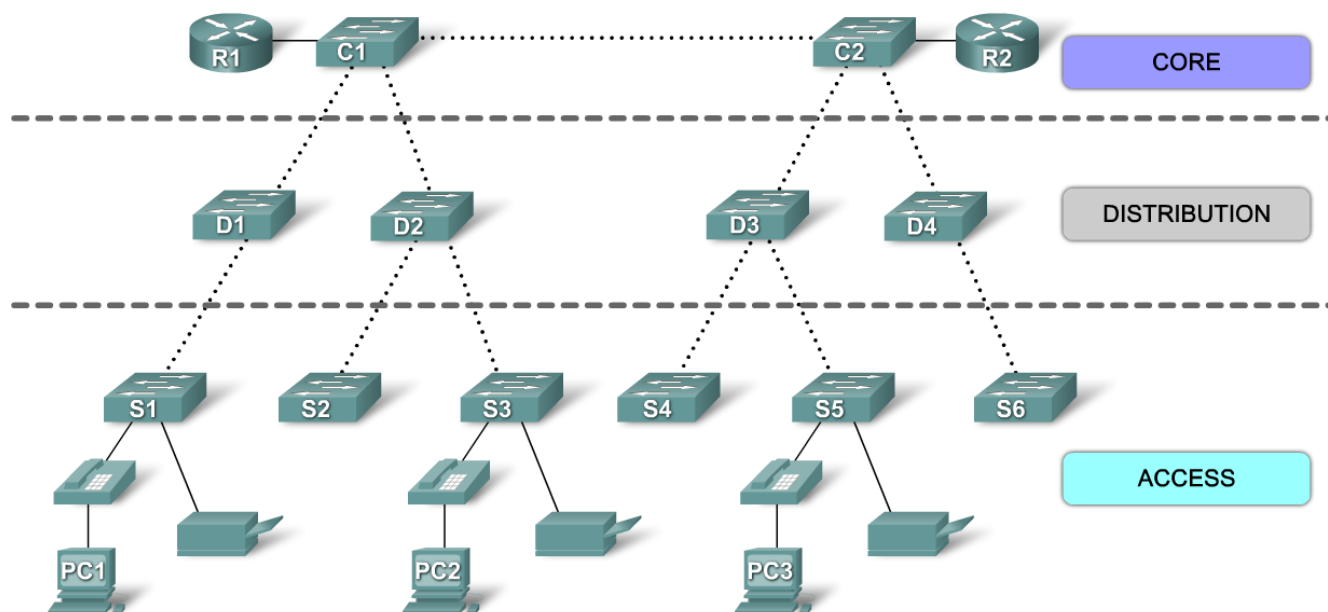
The Hierarchical Network Model



Describe how a Hierarchical Network Supports the Needs of a Small & Medium-Sized Business

- Describe the key principles of hierarchical network design

A Hierarchical Network in a Medium-Sized Business



Describe how a Hierarchical Network Supports the Needs of a Small & Medium-Sized Business

- Describe the role of a converged network in supporting small and medium-sized (SMB) business voice, video, and data needs

Convergence



Medium to Large Businesses



Small to Medium Businesses

Match the Appropriate Cisco Switch to each Layer in the Hierarchical Network Design Model

- Identify the considerations used to select a switch for a hierarchical network

Port density is the number of ports available on a single switch.

24-port switch



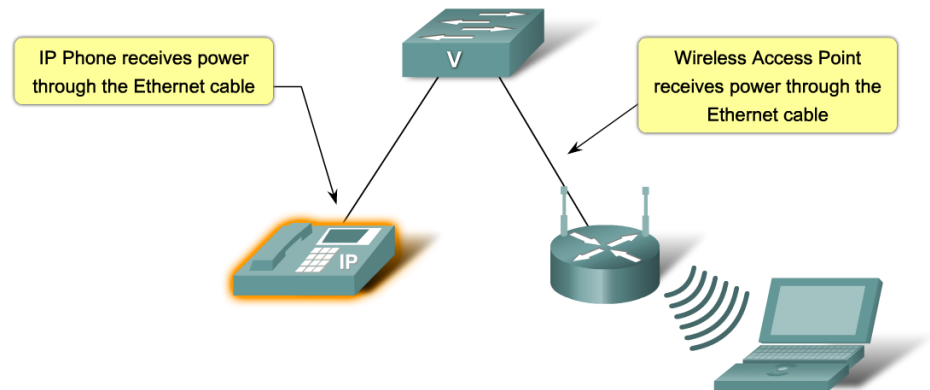
48-port switch



Modular switch with up to 1000+ ports



PoE and Layer 3 Functionality



Match the Appropriate Cisco Switch to each Layer in the Hierarchical Network Design Model

- Identify the key features of switches that are used in hierarchical networks

Switch Form Factors

Fixed Configuration Switches



Features and options are limited to those that originally come with the switch.

Modular Configuration Switches



The chassis accepts line cards that contain the ports.

Stackable Configuration Switches



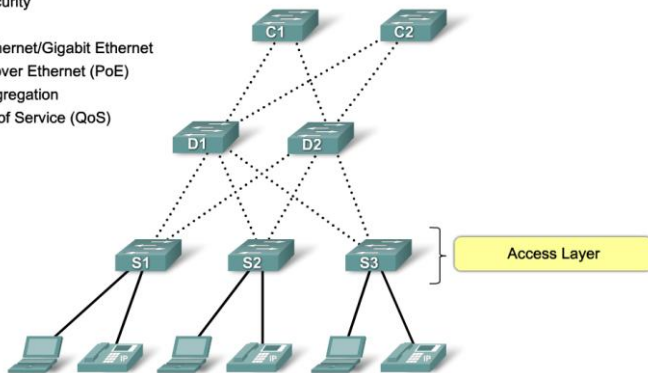
Stackable switches, connected by a special cable, effectively operate as one large switch.

Match the Appropriate Cisco Switch to each Layer in the Hierarchical Network Design Model

- Identify the switch features found in each level in a hierarchical network

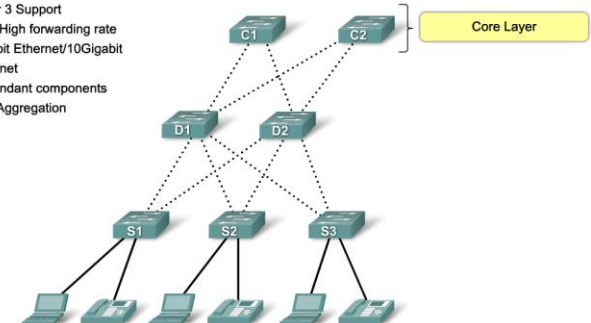
Access Layer Switch Features

- Port security
- VLANs
- Fast Ethernet/Gigabit Ethernet
- Power over Ethernet (PoE)
- Link aggregation
- Quality of Service (QoS)



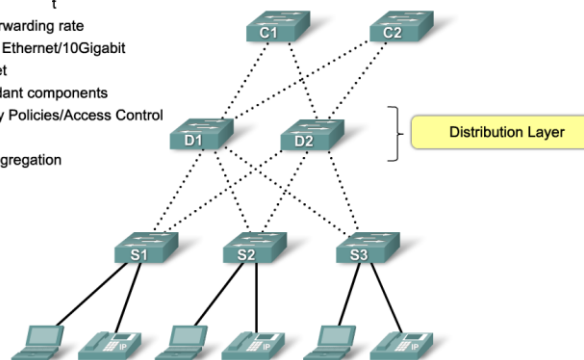
Core Layer Switch Features

- Layer 3 Support
- Very High forwarding rate
- Gigabit Ethernet/10Gigabit Ethernet
- Redundant components
- Link Aggregation
- QoS



Distribution Layer Switch Features

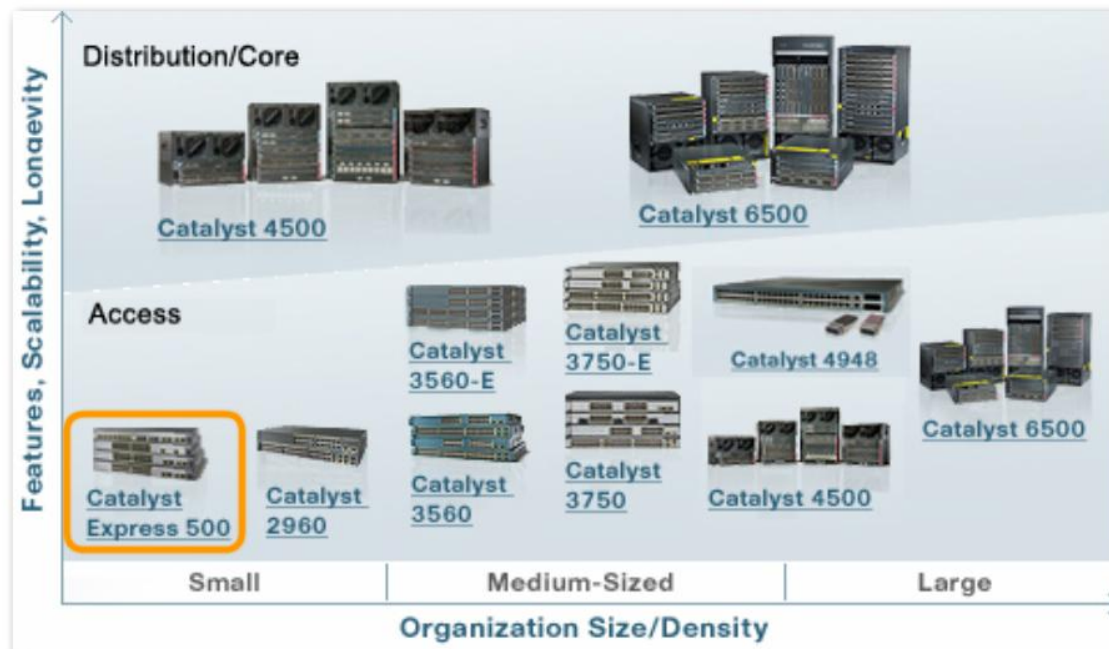
- High forwarding rate
- Gigabit Ethernet/10Gigabit Ethernet
- Redundant components
- Security Policies/Access Control Lists
- Link Aggregation
- QoS



Match the Appropriate Cisco Switch to each Layer in the Hierarchical Network Design Model

- Identify the Cisco switches used in SMB applications

Features of Cisco Catalyst Switches



Summary

- Hierarchical Design model addresses performance, scalability, maintainability & manageability issues.
- Traffic Analysis is used to monitor network performance.
- Hierarchical Design Model is composed of 3 layers:
 - Access
 - Distribution
 - Core
- Switches selected for each layer must meet the needs of each hierarchical layer as well as the needs of the business.

